Third United Nations International Conference on the Peaceful Uses of Atomic Energy

A/CONF.28/A/297
USSR
February 1964
Original: RUSSIAN

Confidential until official release during Conference

Abstract

RESEARCH ON HIGH TEMPERATURE PLASMA PHYSICS AND CONTROLLED THERMONUCLEAR FUSION IN THE USSR

L.A.Artsimovich

1. The principal problems defining the trends of research at the present stage:

a)Plasma containment methods providing its stability;

b) Effective methods of plasma heating.

2. The results of the theoretical investigation on stability problem; stability in magnetic bottles of open and closed types with constant fields. The theoretical analysis of radio-frequency field stabilizing effect.

3. The experimental investigation of adiabatic magnetic bottles of open type.

a) The analysis of a magnetic mirrow system (ion magnetron, Ogra et al);

b) Systems with hybrid fields providing magnetic field strength rise in all directions from the plasma area (PR-5 and other devices). The relation of containment time and plasma density and temperature.

4. Experimetal investigations on closed magnetic systems

a) Plasma heating in toroidal systems with a strong stabilizing longitudinal field (Tokomag type devices).

b) Development of magnetic mirrows based on the stellarator principle.

5. Studies on various new methods of plasma heating.

a) the experiments on turbulent plasma heating by radio-frequency fields.

b) experiments on magneto-acoustic and cyclotron resonance.

6. Research on plasma containment by radio-frequency fields (travelling wave systems, devices based on dynamic stabilization concept etc).

7. Some new results of research on plasma heating during fast pulsing processes with a large power release.

8. Methodic development.

Translation provided by courtesy of the submitting Government